

# Environmental Chamber at the forefront of Building Engineering Technology —

Important contract obtained with Hydro-Québec on special insulation strategy for flat-roof houses

Unique in North America, Concordia's Environmental Chamber is at the cutting edge of building envelope research. The Chamber, measuring over seven meters in height and almost ten meters in length, is a rare facility capable of providing researchers with a full-scale model of building envelope performance.

The facility is capable of testing the thermal resistance of walls, rain penetration, freeze-thaw effects, crack formation, air infiltration, condensation, construction productivity and automation. In addition, it doubles as one large climatic chamber where studies are undertaken in the areas of combined heat and moisture transfer, heat storage, indoor air quality as well as energy efficient control strategies.

Researchers from Concordia's School for Building (SFB), with the financial support of the Natural Science and Engineering Research Council (NSERC) and *Fonds pour la formation de chercheurs et l'aide à la recherche (FCAR)*, began construction of the Chamber in 1992 under the leadership of Dr. Paul Fazio, Chair of Concordia's School for Building.

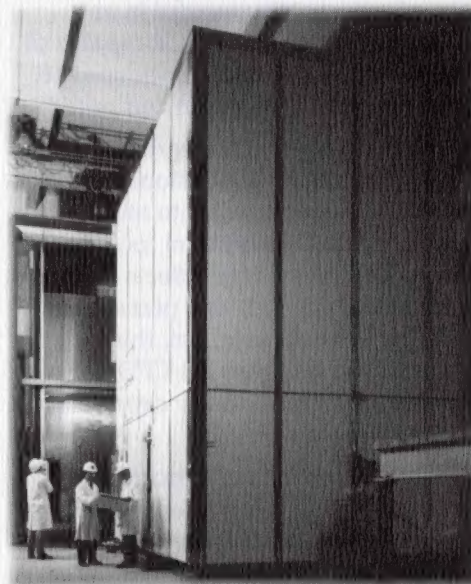
The facility was completed in December 1995, however three months of preliminary testing and instrument calibration was required before the

Chamber could be declared fully functional.

A second project focusing on the study of moisture migration through walls and ceilings insulated with cellulose (recycled newsprint) has brought the School to the forefront of building envelope research and has attracted interest and visitors from abroad. The project, guided by Dr. Paul Fazio as principal investigator, consisted of two huts, modeling wooden flat roof houses popular in Quebec, constructed within the Chamber and subjected to one complete November to June cycle. The results of this test are currently under analysis and will form the basis of an upcoming Ph.D. thesis.

The significance of this research in determining the potential for deterioration of wood structures due to the possible accumulation of moisture within the cellulose insulator, has attracted the interest of the wood industry and has led the School for Building to play a major role in the newly proposed National Centre of Excellence for Wood Construction.

The \$65,000 project was developed by building engineers at SIRICON to validate a proposed insulation strategy within a mandate they had won in partnership with SNC and the Conservation Services Group of the United States to provide quality assurance for Hydro-Québec's "isolation" program. This program is an initiative to



reduce energy consumption through the insulation of houses in Quebec.

A new project, funded by the External Research Program of the Canadian Mortgage Housing Corporation (CMHC) is currently underway in the climatic chamber focusing on air exfiltration patterns and will help establish criteria for the prediction of the behaviour of reinsulated walls.

*For further information on the Environmental Chamber please contact Paul Fazio at (514) 848-3210 or via e-mail [fazio@vax2.concordia.ca](mailto:fazio@vax2.concordia.ca)*



# Computational Fluid Dynamics Lab Receives \$612,880 Major Installations Grant from NSERC

Purchase of state-of-the-art computer solidifies CFD Lab as a leader in the field of flow computation simulation

Concordia's Computational Fluid Dynamics Laboratory under the guidance of Dr. Wagdi Habashi struck a major coup last April as it was awarded a \$612,880 grant from the Natural Sciences and Engineering Research Council of Canada (NSERC).

Funds from this grant, coupled with a \$75,000 contribution from Concordia, helped finance the purchase of a state-of-the-art Silicon Graphics 16-CPU Origin 2000 computer. According to Dr. Habashi, this new computer is currently the most powerful in any CFD lab across Canada. "It is capable of intense large-scale computations at 16 times the speed of a single computer".

The Origin 2000 will allow the lab to move from two-dimensional conceptual-based models to more complex three-dimensional models which mirror the actual effects of wind or ice on objects such as a plane wing or the hull of a ship. In fact, this acquisition establishes the CFD Lab as the only lab in the country capable of 3D flow simulation.

Habashi maintains the importance of this purchase vis-à-vis interest from industry. "We are no longer toying with concepts. This computer now allows us to do actual test cases with specific projects in industry". In fact, the CFD Lab, in collaboration with CAE Electronics, is currently investigating the effects of air flow over Navy ships to simulate the landing of helicopters and how wind effects surrounding the vessel will affect their landing.

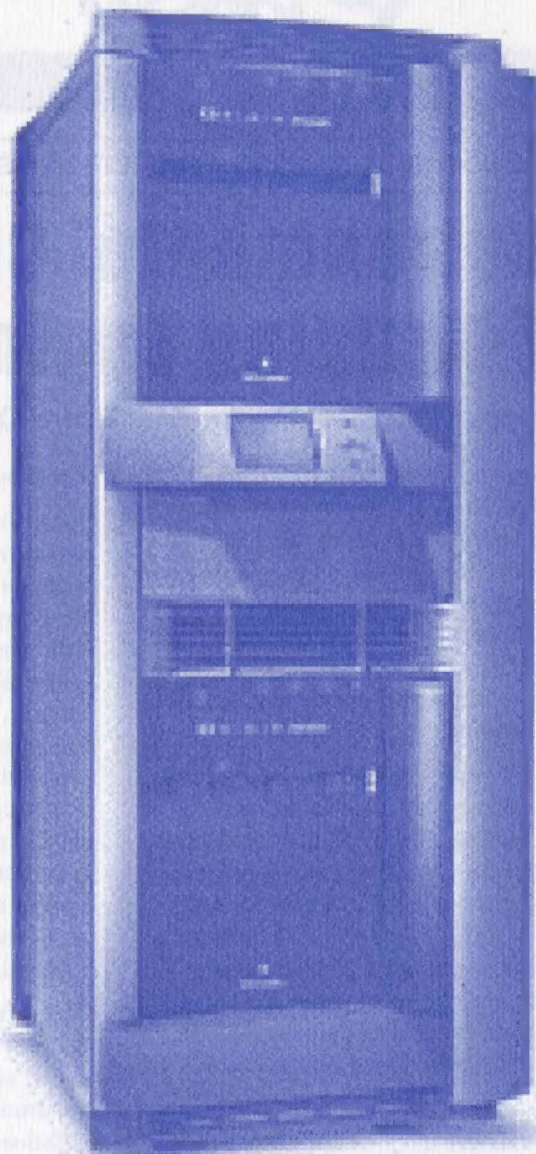
The lab is also involved in an Environment Canada project involving the CONVAIR 580 aircraft used to collect data on icing, specifically when traveling through ice-forming clouds. The CFD lab's calculations will inform pilots specifically when to exit these clouds before icing problems occur.

This project marks the first time the accumulation of ice over an entire aircraft will be studied. Previously researchers could only focus on certain sections of a plane at one time due to the enormous complexity of examining icing effects over the entire hull.

Just recently the lab has started work on an aero-acoustics project with Pratt & Whitney Canada where the propagation of aerodynamic noise from an aircraft's engine will be examined in order to find ways of muffling the sounds for more pleasant commercial traveling.

The awarding of a Major Installations Grant is no small feat explains Dr. Habashi, "NSERC usually only awards five or six per year and very seldom are they towards computers. They were very impressed by the strong show of support given by Concordia towards this venture". Representatives from NRC, Pratt & Whitney, CAE and *le Centre de recherches mathématiques (Université de Montréal)* along with Concordia Rector Frederick Lowy, Vice-Rector and Provost Jack Lightstone and former Dean of Engineering & Computer Science Donat J. Taddeo, showed their support for the lab during NSERC's onsite visit last January.

In honour of this acquisition a recent reception was held for the official opening and presentation of the activities of the CFD Lab for the current academic year. According to Dr. Habashi, the team of researchers from NSERC were given the distinct impression that Concordia had a clear vision of where it was going and consequently were found deserving of the grant.



Silicon Graphics' 16-CPU Origin 2000: the latest addition to Concordia's Computational Fluid Dynamics Laboratory

For further information regarding the CFD Lab and its activities please contact Dr. Wagdi (Fred) Habashi (514) 848-3165 or via e-mail: [habashiw@cfdlab.concordia.ca](mailto:habashiw@cfdlab.concordia.ca)



# Administrative Changes take place within Faculty

Restructured Decanal Team welcomes Dr. Terry Fancott as Associate Dean in charge of Undergraduate Programs and Student Affairs

The Faculty Decanal Team underwent significant changes over the last few months as new faces joined its ranks while others experienced changes to their duties and responsibilities.

Under the leadership of newly-appointed Dean Nabil Esmail, the Decanal Team is the Faculty's Executive administrative group responsible for the direction of all operations within the Faculty of Engineering & Computer Science. Each member of the team manages, in collaboration with the leaders of the Faculty's four Academic Units, specific areas identified for action by the Executive Committee level of the Faculty.

Joining the team is Dr. Terry Fancott who assumes the role of Associate Dean in charge of Undergraduate Programs and Student Affairs. Dr. Fancott, who had previously held the position of Associate Dean for the Faculty from 1986-1993, is responsible for the management of undergraduate student affairs policies, academic regulations, student records, the Coop Program as well as undergraduate requests and conflict resolution. He also assists in the planning and development of undergraduate curricula and acts as liaison with the University Registrar and Undergraduate Student Association.

Dr. Ted Stathopoulos, who previously assumed the role of Associate Dean in charge of Academic and Administrative Affairs during Dr. Donat Taddeo's

term, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

ments and the appraisal of the Academic Units. He also manages the Staff Job Evaluation Program as well as space development within the Faculty.

ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

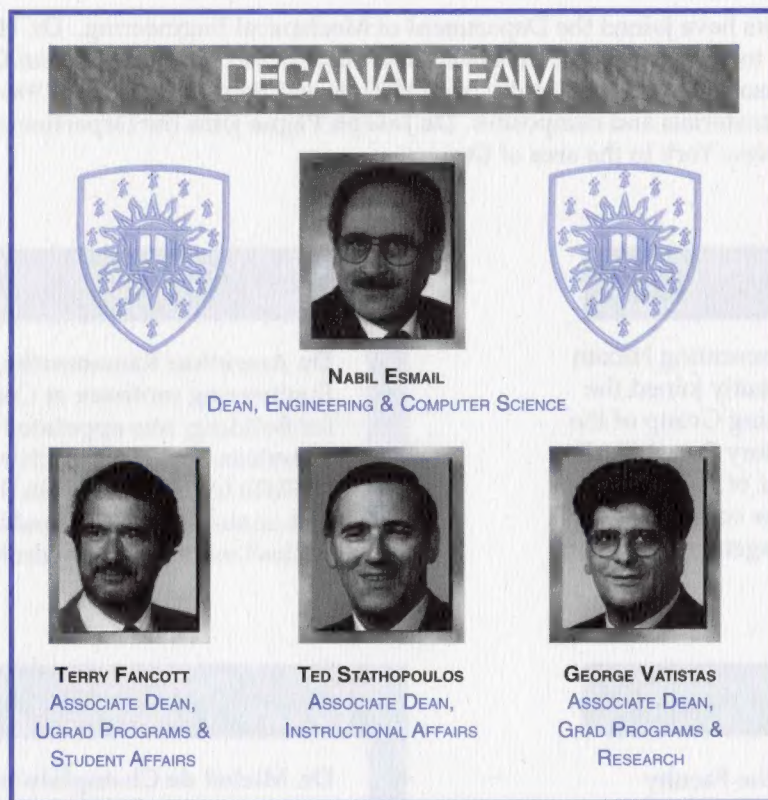
ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

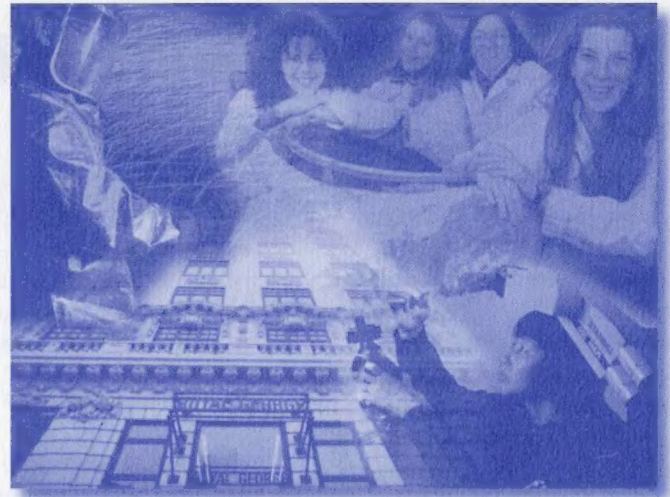
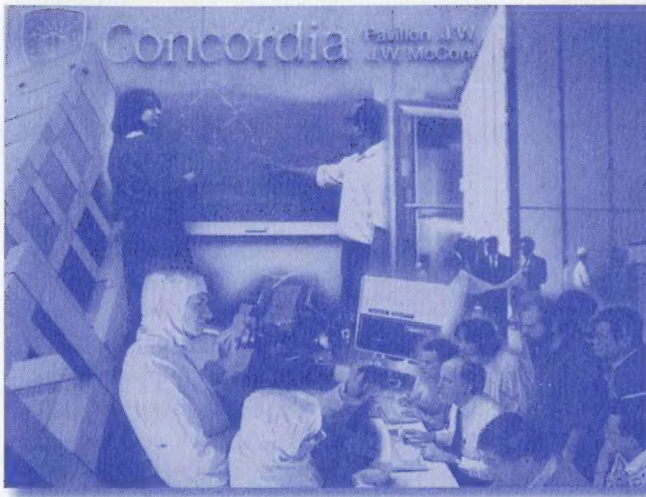
ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-

ment, maintains his position as Associate Dean, responsible for Instructional Affairs of the Faculty. His responsibilities include the development of undergraduate and graduate faculty instruction, full-time and part-time faculty teaching assign-







# Faculty's Engineering Programs successfully Accredited

Canadian Engineering Accreditation Board accredits all six undergraduate engineering programs at Concordia

The Canadian Engineering Accreditation Board (CEAB) granted accreditation to all of Concordia's undergraduate engineering programs last June. A team of professional engineers from both the public and private sector travelled to Concordia last November to examine the academic and professional quality of its engineering faculty, the adequacy of its laboratories, equipment and computer facilities and the quality of its engineering students' work. According to Dr. Ted Stathopoulos, Associate Dean responsible for Instructional Affairs of the Faculty, "Their decision was reflective of the sound engineering education provided by the Faculty and the excellent group of professors making up its teaching core".

Specifically, the CEAB agreed to grant a three year accreditation term extending to June 30, 2000 to the Building, Computer, Electrical and Mechanical Engineering programs with the possibility of extension beyond this date contingent on the receipt of a progress report by June 30, 1999.

The Industrial Engineering program

was granted accreditation for a three year period extending to June 30, 2000 as well. As it stands, Concordia is the only english university in Quebec to offer this specialized program. Finally, Civil Engineering received a six year accreditation extension to June 30, 2003.

Dr. George Vatistas, Associate Dean in charge of Graduate Studies and Research, explained that students graduating from an accredited program are eligible for admittance into the province's professional engineering order as well as other professional engineering affiliations across Canada. This membership, coupled with some experience in the engineering field, would then allow students to obtain their license to practice professionally.

The CEAB was established in 1965 by the Canadian Council of Professional Engineers (CCPE) to accredit Canadian undergraduate engineering programs that meet or exceed educational standards acceptable for professional registration in Canada.

The CEAB is composed of thirteen professional engineers drawn from the private, public and academic sectors. The members are volunteers and

represent different parts of the country as well as a wide range of engineering disciplines. The CEAB also relies on the volunteer services of an extensive network of professional engineers who serve on the visiting teams and committees.

After the accreditation visit is completed an in-depth analysis of the institution's curriculum content is performed to ensure that it meets accreditation criteria. The team then reports its findings to the CEAB which then makes an accreditation decision. It may grant or extend accreditation of a program for a period of up to six years or it may deny accreditation altogether.

According to Dr. Nabil Esmail, Dean of the Faculty, accreditation of the Faculty's engineering programs is yet another reason for students to pursue their engineering education with Concordia. "We provide students with programs that are professionally recognized within the engineering community and now with the establishment of co-op, offer the perfect mix of theory and practical application".



# Supermileage Vehicle Fueled by CAE Sponsorship

Concordia's Society for Automotive Engineers Student Chapter enjoys support from local high-tech company

Students from Concordia's Mechanical Engineering Department developed an innovative car this year geared towards extracting the maximum amount of energy from a predetermined amount of fuel. Components used to create this fuel-efficient vehicle border on the bizarre: bicycle tires, a lawnmower engine, a plexiglass covering and the absence of a muffler or shock absorbers.

This innovative project, designed to compete in the Super Mileage Competition held annually in the United States under the supervision of the Society for Automotive Engineers, is a product of industry and academia working hand in hand for mutual benefit.

Last year's entry from Concordia finished seventh out of twenty five

participating North American universities. Although the team had made improvements from its 12th place position the previous year, team members hope to improve their standings for 1998.

In a field of american teams enjoying substantial corporate funding, it is essential that Concordia do the same if they hope to achieve their goal.

The recent support of Montreal-based high-tech giant CAE Electronics has answered the team's prayers and more. Not only has CAE subsidized this year's project, they are also giving students access to their St-Laurent Plant, where tooling facilities and employee expertise are readily available.

In a recent article published in the Montreal Gazette, Wesley Finch, staff adviser to the team, explained that Government cuts to universities have had an impact on Concordia's ability to provide practicum.

"We had a machine shop that rivaled that of CAE but we no longer have the staff for it". CAE's goodwill gesture now provides students with the required facilities and gives them a sense of what it's like to work on a project of this nature in industry.

In familiarizing students with its corporate culture and methods of operation CAE is also benefiting from this exchange. Students are being groomed for potential summer internships with the company or perhaps permanent employment further down the road.



## Department of Computer Science Hosts International Computer Programming Competition

Association for Computing Machinery (ACM) selects Concordia as hosts for North Eastern Region preliminary round competition

Seven student teams from universities in Canada and the United States competed in an international computer programming competition organized by the Association for Computing Machinery (ACM) last September at Concordia University.

Hosted by the Department of Computer Science, this international collegiate programming contest provides students with an opportunity to demonstrate and sharpen their problem-solving and computing skills.

The contest is a two-tiered competition among teams of students representing institutions of higher education. Teams first compete in regional contests held around the

world from September to November each year. The winning team from each regional contest advances to the ACM International Collegiate Programming Contest World Finals, held this year in Atlanta, Georgia.

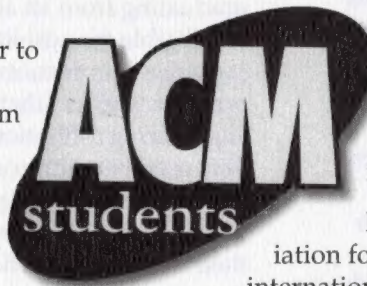
Concordia was selected to host the North Eastern Region Preliminaries, representing all of Quebec, the Maritimes, Upstate New York and New England.

Students were given a six hour period to solve six programming problems using one of three languages: C, C++ or Pascal. The winning team,

representing McGill University, won the competition by virtue of completing all six problems in the fastest time.

Founded in 1947, the Association for Computing Machinery is an international scientific and educational organization dedicated to advancing the arts, sciences, and applications of information technology. With a worldwide membership of 80,000, ACM functions as a locus for computing professionals and students working in the various fields of information technology.

*For more information on the ACM competition please contact Dr. Manas Saxena at (514) 848-3024 or via e-mail: [manas@cs.concordia.ca](mailto:manas@cs.concordia.ca)*





# Faculty News

September-October 1997 Faculty of Engineering & Computer Science Concordia University

## THREE PROFESSORS APPOINTED IN MECHANICAL ENGINEERING

Three full-time professors have joined the Department of Mechanical Engineering. **Dr. Henry Hong** moves from Senior Design Engineer to professor in the area of control automation. **Dr. Raja Mohan Ganesan**, who was previously a research associate with the Faculty from 1992-96 and then an LTA from 1996-97, becomes a full-time professor in the area of materials and composites. **Dr. Joseph Pegna** joins the Department from Rensselaer Polytechnic institute in New York in the area of Design.

## NEW MEMBER SELECTED FOR FACULTY EXTERNAL ADVISORY BOARD

**Mr. Hameed Uddin** representing Hicom Data Systems (HDS) recently joined the Computer Science Working Group of the Faculty's External Advisory Board (EAB). Mr. Uddin is the founder of HDS, a company which provides customized turnkey enterprise management software solutions.

## DR. AMRUTHUR RAMAMURTHY HONOURED BY ASME

**Dr. Amruthur Ramamurthy**, Civil Engineering professor at Concordia's School for Building, was appointed Fellow of the American Society of Mechanical Engineers (ASME) for his research in the computation and application of the fundamental principles of fluid mechanics to hydrology.

## VISITING PROFESSOR JOINS SCHOOL FOR BUILDING

**Dr. Ronie Navon** joins the Faculty from the Technion-Israel Institute of Technology in Israel from August 1, 1997 to July 31, 1998 where he will be teaching courses in Building Economics as well as in Computers & MIS in Construction.

## SOFTWARE ENGINEERING PROFESSOR JOINS ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT

**Dr. Michel de Champlain** was appointed professor in the Faculty's Software Engineering Program. Prior to joining Concordia, Dr. de Champlain was an Associate Professor in the Laboratory of Instrumentation, Microcomputers and Electronics (LIME) at *université Joseph Fourier* in Grenoble, France.



is a quarterly publication of the Faculty's Communications Office distributed free of charge to the members of the Engineering & Computer Science Community

Please send submissions and comments to Michael Lennane LB1009-1 (514) 848-3073 or via e-mail: [mike@encs.concordia.ca](mailto:mike@encs.concordia.ca)